Gender Differences in Stress, Appraisal, and Coping During Golf Putting

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Abstract

Gender differences in coping in sport have received increased attention but cross-sectional and retrospective designs of studies have provided equivocal results and limited conclusions in the area. To address this gap two studies were conducted investigating stress, appraisal and coping in males and females when executing a golf putting task. The two studies were conducted under controlled laboratory settings including a control and an experimental condition. Participants performed the same golf putting task in both conditions. In the experimental condition stress was induced using a combination of evaluation apprehension, funny putter, monetary inducement (study one) and, ego-threatening feedback (study two). Stress appraisal (type of stressor and its frequency) and coping (strategies used and their frequency) were assessed online using the think aloud protocol. Stress responses were assessed using self-report, physiological, and behavioral measures. Both studies found similar stress responses for males and females (e.g., increased heart rate, task completion time, and cognitive state anxiety) in the experimental condition. However, significant gender differences were found in relation to the frequency of stressors cited and coping strategies used for these particular stressors. Across both studies, females reported being more often concerned with task execution and males with the outcome. Differences in coping strategies observed between the genders were likely to be a consequence of different stress appraisals, in particular the frequency of particular stressors appraised. Findings provide tentative support for the situational hypothesis as males and females have a tendency to use similar coping strategies if they appraise the same stressors within the same situation.

Keywords: stressors, coping, verbalizations, male, female

Gender Differences in Stress, Appraisal, and Coping During Golf Putting

Coping reviews have suggested that male and female athletes might utilize different coping strategies when dealing with stressful encounters (Hoar, Kowalski, Gaudreau, & Crocker, 2006; Nicholls & Polman, 2007). These gender differences in coping could be explained by a meta-analytic finding that males and females appraise events differently (Tamres, Janicki, & Helgeson, 2002) and the notion that appraisal directly influences coping (Lazarus & Folkman, 1984). Overall, these reviews indicate that gender is an important variable in the stress, appraisal and coping process. However, to date results concerning gender differences within sport have been equivocal (Kaiseler & Polman, 2010).

Lazarus and Folkman's (1984) transactional theory of stress and coping is the most widely used model in sport (Nicholls & Polman, 2007) and contains a two-tiered appraisal process. Primary appraisal is the process of assessing the impact of the event in relation to the individual's physical and psychological well-being. Females have been found to appraise a specific stressor more severely than males. Also, females use more coping strategies in studies in which they reported higher levels of stress intensity (Tamres et al., 2002). These findings suggest that previous gender differences in coping behavior might be a result of appraisal differences among men and women. Secondary appraisal is a cognitive evaluative process in which the person analyzes his or her coping options in relation to the specific situation, focusing on minimizing harm and maximizing gains or favorable outcomes (Lazarus & Folkman).

Coping has been defined by Lazarus and Folkman (1984) as "a constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p.141). Coping responses can be categorized into three broad higher order dimensions (Nicholls & Polman, 2007). Problem-focused coping describes strategies used to minimize distress by reducing or eliminating the stressor. Emotion-focused coping involves strategies used to regulate emotional arousal and distress. Finally, avoidance coping includes behavioral and cognitive efforts to disengage from a stressful situation.

It has been debated whether coping should be measured at the strategy or the dimensional level (Skinner, Edge, Altman, & Sherwood, 2003). A limitation of assessing coping at the dimensional level is that a single coping strategy could be classified within more than one dimension making it impossible to accurately classify a coping strategy. Also, gender differences in coping might be limited to one or two strategies within these broad dimensions (Nicholls & Polman, 2007).

Two contrasting hypotheses provide explanations why males and females may cope differently. The dispositional hypothesis posits that males and females have different underlying characteristics that cause different coping behaviors (Tamres et al., 2002). These underlying differences can be biological or social in nature and include variation in emotional expression, social support seeking, response to stress, and socialization. The dispositional hypothesis predicts that gender differences in coping will be found across situations and social roles. The situational hypothesis (Rosario, Schinn, Morch, & Huckabee, 1988) suggests that situations influence coping. Differences in coping are likely to be influenced by the different stressors males and females encounter, and/or the different roles males and females occupy in society. The situational hypothesis predicts that gender differences will disappear when males and females experience the same stressor under similar conditions (Sigmon, Stanton, & Snyder, 1995).

A limitation of the majority of research within the stress and coping sport literature relates to how these constructs are assessed (see Nicholls & Ntoumanis, 2010 for a review). Most studies have been retrospective in nature, asking participants to recall stressful situations and subsequent coping behaviors with significant time lags. Retrospective assessment can be detrimental in terms of accurate recall and appraisal significance. As suggested by Ptacek, Smith, Espe, and Raffety (1994) as time passes participants' reports about previous events become less accurate. Additionally, gender differences in coping are especially likely to emerge when individuals are asked how they usually cope with a stressor retrospectively, rather than how they coped with a stressor in real time (Contrada & Baum, 2010). In agreement with this idea, Kaiseler, Polman and Nicholls (2012) found

gender differences in coping for male and female soccer players, across three different soccer scenarios, using a retrospective cross sectional design. Hoar, Crocker, Holt, and Tamminem (2010) used a 12-month retrospective design when investigating gender differences in the type of coping strategies adolescent athletes used to manage sport-related interpersonal stress. Although this study contributed to our knowledge in this area by revealing that male and female adolescent's athletes coping efforts depend on the context of specific interpersonal stress sources, the results were susceptible to memory decay.

In order to circumvent limitations associated with retrospective recall, Nicholls and Polman (2008) adopted the think aloud (TA) protocol proposed by Ericsson and Simon (1993). There are three levels of TA. Level 1 and 2 verbalizations require individuals to verbalize their thoughts. The difference between Level 1 and 2 verbalizations is that Level 1 verbalizations do not need to be transformed before being verbalized by the individual (e.g., adding up the cost of items in a shopping list to calculate the cost) whereas Level 2 verbalizations require the individual to transform their verbalizations (e.g., transforming images into words, such as describing one's thoughts on a piece of art). Level 3 verbalizations require participants to verbalize explanations of their thoughts, ideas, or hypotheses (e.g., providing an explanation why certain action has been performed). A review of 40 studies found no evidence that giving concurrent verbal expressions (Level 1 or 2 TA) of one's thoughts altered performance compared to individuals who completed the same tasks silently (Ericsson & Simon, 1993). Nicholls and Polman (2008) assessed stress and coping during golf performances, using Level 2 verbalizations (i.e., participants verbalized what they were thinking), over six holes of golf. This study provided support for the notion that stress and coping is a recursive process that changes across phases of the same performance. The golfers often experienced several stressors before attempting to cope. However, this study did not assess behavioral or physiological variables that might accompany stress and coping in achievement situations. In particular, stressful performance situations were associated with increased heart rate

(Vickers & Williams, 2007) and with participants taking longer to complete a motor task (Masters, 1992).

Finally, a limitation of most of the coping research is that it has not been investigated in relation to the characteristics of the stressor (Crocker, Mosewich, Kowalski, & Besenski, 2010). The current studies therefore investigated coping preferences at the strategy level in relation to specific stressors. Two studies were conducted in which different forms of stress were induced. The aim of both studies was to examined stress, appraisal and coping among male and female during the execution of a golf putting task to determine whether the situational or dispositional hypothesis was more accurate. In particular, the two studies examined the effect of gender on stress (physiological functioning, behavior), appraisal, and coping during the completion of a golf putting task during a control and experimental condition. It was predicted that males and females would report similar coping strategies when they reported similar stressors during the putting task supporting the situational hypothesis.

Study 1

Method

Participants

Participants were 37 (n = 19 males and n = 18 females) British University students aged between 19 and 22 years old (M age = 20.74 years; SD = 1.87). Exclusion criteria for the study were the possession of an official golf handicap or being a member of a golf club. The study was approved by a University's Research Ethics Committee and participants provided informed consent prior to participating.

Apparatus and Questionnaire

The golf putting task was completed on an elevated 15 cm wooden putting surface, which was 4 m in length and 1.80 m wide, covered with a carpet. A standard golf putter and white golf balls were used by all participants. Putts were made from a distance of 2.30 m from the hole which had a diameter of 10.8 cm. In addition, in the stress condition, participants used a "funny putter"

(Beilock & Carr, 2001). This putter consisted of a regular putter head attached to an S-shaped curved and arbitrarily weighted putter shaft. Heart rate was assessed using the 810 Polar Heart Rate monitor (Kempele, Finland) and anxiety was measured via the revised Competitive State Anxiety Inventory (CSAI-2R; Cox, Martens, & Russell, 2003). The CSAI-2R is a multidimensional domain specific instrument to assess anxiety in competitive sport situations. It consists of 17 questions, in which participants were asked to answer "How are you feeling right now?" The scale uses a 4-point Likert type response scale anchored at 1 = *'Not at all'* and 4 = *'Very much.'* The CSAI-2R has three factors: Somatic anxiety (seven questions), Cognitive anxiety (five questions) and Self-confidence (five questions). Because the present study was interested in anxiety the latter scale was not considered. Good psychometric properties (reliability and fit indicators) have been reported for the CSAI-2R (Cox et al., 2003).

Task completion time was recorded in the present study with a stopwatch. A video camera (Sony DCR-VX1000E Camcorder, Thatcham, United Kingdom) mounted on a tri-pod was used in the stress condition. Finally, participants' verbalizations were recorded using a digital voice recorder (Olympus WS-320M, China) and microphone. The voice recorder was placed in one of the participant's pockets whereas the microphone was clipped on the participant's collar.

Procedure

The study consisted of two distinct conditions, a control and an experimental or stress condition. Because of the within subject design the two conditions were presented in a counter balanced order across participants. In both conditions participants were required to putt 20 golf balls to the hole and to think aloud using level 2 verbalization. No time constraints were imposed on participants in any of the conditions, but the total time taken to complete the set of 20 putts was recorded in both conditions. After completing informed consent, participants attached the heart-rate monitor belt to their chest and watch to their wrist. They were then instructed to sit quietly for 4 minutes to obtain a baseline heart-rate, and were allocated to one of the conditions. After the explanation of the condition, participants were requested to complete the pre-test version of the

CSAI-2R (Cox et al., 2003). Following this, the think aloud procedure was explained and the training exercises were conducted (following Nicholls & Polman, 2008). Participants were instructed to talk continuously throughout the 20 putts apart from when they were executing the putt. If participants were silent for a period longer than 10 seconds they were asked to resume thinking aloud (Ericsson & Simon, 1993).

In the control condition participants were required to putt 20 golf balls to the hole, using a standard putter. In the experimental condition participants were required to putt 20 golf balls to the hole, with induced stress. In this condition, a combination of evaluation apprehension, financial inducement, and funny putter were used. For this purpose a video camera was brought into the room and placed to the side and top of the golfing surface. This ensured that participants were aware of being videotaped but the camera did not hinder their line of sight. The following statement was then provided:

> In the next set of 20 putts we would like you to use a newly designed putter which is said to improve golf-putting performance. In addition to this, we are going to film this part of the session. We are keen to discover how people adapt to using this new putter. Finally, although we suggested that you could potentially earn £5 pounds by participating in this experiment we believe that you will need to earn this reward. To this end, for every put you miss we will deduct 20 pence from the possible £5 pounds you can earn with participating in this experiment. Remember, you will still need to think aloud when putting the 20 balls. If you have any questions please ask the researchers present.

Following this statement, participants were introduced to the funny putter. The video camera was switched on and participants started putting in the experimental condition.

After completion of the 20 putts in both conditions, participants were required to complete the post-test version of the CSAI-2R (Cox et al., 2003). Successful performance was defined by the ball dropping in the hole and was recorded by a researcher for each attempt in both conditions.

Analysis Strategy

Means, standard deviations, and internal consistency were calculated prior to statistical analysis. A repeated measures multivariate analysis of variance (MANOVA) was conducted to establish whether there were gender differences in the control and experimental condition for the dependent variables heart rate, task completion time, state anxiety, and performance. In the instance of a significant main or interaction effects follow-up repeated measures univariate analysis (ANOVA) was conducted.

The think aloud data sets for the experimental condition were subjected to protocol analysis (Ericsson & Simon, 1993). Data were transcribed verbatim, and each transcript was subjected to checks for relevance and consistency. To fulfill the relevance criterion the verbalizations by the participants should be relevant to the task, which in this case meant verbalizations associated with golf putting performance. To fulfill the consistency criterion, verbalizations should be consistent with verbalizations that precede them. Streams of consistent verbalizations are assumed to represent cognitive processes as suggested by "can be used as evidence for the course and nature of these processes" (Ericsson & Simon, p. 170). Following checks for relevance and consistency, each transcript was subjected to a line-by-line inductive content analysis (Maykut & Morehouse, 1994) to identify stressors and coping responses. Verbalizations that the first author perceived had caused the golfers negative concern or worry, or had the potential to do so were coded as stressors. Verbalizations that involved the golfers attempting to manage a stressor were coded as coping strategies. Although some data were relevant to the golf putting task and consistent with the participant's performances, they were not coded as either a stressor or a coping strategy and were subsequently removed from the analysis. Similar stressors and coping strategies were grouped together as first-order themes and assigned a descriptive label and a rule of inclusion was written for each theme. The encoded segments were then placed in chronological order as decision trees (Ericsson & Simon, 1993) to represent the stressor-appraisals and coping processes inherent in the

data. Based on the outcomes of the protocol analysis coding coping strategies were linked to the reported stressors.

Stressors and coping strategies were tallied for the males and females in the experimental condition. The Chi-square statistic was used to compare gender differences in total number of stressors reported.

Results

Stress Intervention

Table 1 provides the results of the dependent variables for the males and females in both the control and stress condition. Adequate reliability was obtained for somatic (Cronbach α = .83 and .86) and cognitive anxiety (α = .87 and .84) scales of the CSAI-R2 for the two assessments.

The repeated measures MANOVA had a significant time main effect (Wilks' lambda = .65, p < .001, η^2 = .35) and gender main effect ($F(1,31)$ = 4.06, p = .05; η^2 = 10), but no interaction effects (p > .05). Table 2 provides the results of the follow-up repeated measures ANOVA's. Significant condition main effects were obtained for heart-rate $F(1,31)$ = 9.41, p = .004, η^2 = 0.21, task completion time $F(1,31)$ = 22.58, p < .001, η^2 = .39, and cognitive anxiety $F(1,31)$ = 9.33, p = .004, η^2 = 0.21. Higher average heart-rate, increased task completion duration, and higher levels of pre-condition cognitive state anxiety were obtained in the stress condition compared to the control condition. However, no difference was obtained for somatic state-anxiety or performance.

The male and female participants appeared to respond similarly to the stress condition in terms of heart-rate, task completion time, and self-reported somatic and cognitive state anxiety. Except for performance no differences were obtained.

Stress type and gender

Table 3 provides an overview of the frequency of reported stressors by the male and female participants in the stress condition. Due to a technical malfunction, the data were only available for 16 males and 15 females. In total, nine different stressors were identified. Four of the stressors were associated with the study set-up (evaluation apprehension, financial inducement, putter, and think

aloud) and two with performing the task (task execution and physical discomfort). The final three stressors were goal endangerment, lack of concentration, and outcome. No differences were found between the males and females in the total number of stressors reported in the stress condition (χ^2 = 0.64, p = .42). However, the females reported the putter (χ^2 = 19.31, p < .001) and task execution (χ^2 = 11.56, p < .001) significantly more frequently than males. The outcome was reported significantly more frequently as a stressor by males than females (χ^2 = 4.00, p = .05).

Gender, stressor type, and coping strategies

Table 3 provides an overview of the coping responses used by the male and female participants in response to specific stressors during the stress condition. Males had a tendency to use positive self-talk and relaxation to cope with outcome stressors. Females, on the other hand, used external attributions to cope with the putter and task execution stressors. Few differences in coping preferences were observed for stressors which were reported equally by the male and female participants.

Discussion

The findings of Study 1 indicate that gender differences in coping are the result of the appraisal process rather than gender per se (Folkman & Lazarus, 1980). This provides support for the situational hypothesis. Study 1 was successful in inducing stress among the participants as small, but significant increases in heart-rate, cognitive anxiety, and task completion time were observed in the stress condition in comparison to the control condition. However, higher stress levels did not result in performance decrements or changes in self-rated somatic anxiety. The latter finding provides empirical support for Woodman and Hardy (2003) who stated that self-reported somatic anxiety is of limited theoretical value in explaining the relationship between physiological arousal and athletic performance.

Males were found to successfully hole more putts than the females. However, the absence of other gender main effects in Study 1 suggests that males and females perceived stressors to be of similar intensity. The TA procedure showed gender differences in the types of stressors reported.

Females were significantly more concerned with the funny putter, and their technique in comparison to the males. The males, on the other hand, were more concerned with the outcome. Males and females have reported different types of stressors in the past (e.g., Ptacek, Smith, & Dodge, 1994). However, this is the first study in which gender differences in appraisal have been found despite being in an identical achievement situation. Previous research has found that males are more concerned with the outcome (ego-orientation) in achievement situations and are more competitive than females (Vazou, Ntoumanis, & Duda, 2006; White & Duda, 1994). Such gender differences in motivational orientation could explain why the females in the present study were more concerned with task execution and as such were more concerned with the putter than the males. Similarly, this would also explain why the males reported outcome, an ego-orientated stressor, more than the females in the stress condition.

Differences in coping between the genders in the present study appeared to be caused by the males and females appraising the stressful event differently. Since few differences in coping preferences were observed for stressors which were reported equally by the male and female participants. In other words, coping differences found were only observed for stressor types in which gender differences were observed in terms of its frequency. This supports previous research which has found that individuals cope differently depending on the stressor type (Lee-Baggley, Preece, & DeLongis, 2005).

Study 2

Introduction

The findings of Study 1 supported Tamres et al.'s (2002) suggestion that gender differences in coping are likely to be a consequence of what stimuli are appraised as being stressful within a stressful encounter. Although we did not find any differences between the genders in relation to the intensity of the stressors experienced in Study 1, the male and female participants reported certain stressors more frequently. These differences in the stimuli that was appraised as stressful could be associated with differences in perceptions of control (Lazarus & Folkman, 1984). Secondary

appraisal (Lazarus & Folkman, 1984) reflects an evaluation of the coping strategies an individual could deploy and the belief that he or she could successfully perform the behaviors necessary to manage a stressful situation. Therefore, during secondary appraisal the individual is assessing the control he or she has over a stressor (Lazarus & Folkman, 1984).

Study 2 addressed one of the limitations of Study 1 by assessing participants' control beliefs. Another limitation of Study 1 was the relatively small stress response. As such Study 2 tried to increase induced stress levels by utilizing a different stress manipulation. Finally, Study 2 was conducted to establish whether findings could be replicated albeit in a different stress context. Like Study 1, Study 2 examined whether the situational or dispositional hypothesis was more accurate in explaining coping behavior among male and female.

Method

Participants

Participants were 31 (17 males and 14 females) British University students aged between 18 and 45 years old (*M* age = 23.35 years; *SD* = 7.30). Similarly to Study 1, participants were excluded if they possessed an official golf handicap or were a member of a golf club. The study was approved by a University's Research Ethics Committee and participants provided informed consent prior to participating.

Apparatus and Questionnaire

This study used the same golfing equipment as outlined in Study 1. The Participants also completed a horizontal visual analogue scale to assess participant's level of stress intensity and control over the stress manipulation. Participants were asked to indicate how much stress the stress manipulation caused and how much control they perceived they had over the stress intervention by dissecting a 10 cm bipolar line anchored by two statements ('*not at all stressful'* vs. *'extremely stressful'* and *'no control at all'* versus *'full control'*). The stress thermometer has already demonstrated normal distribution properties and adequate variability (Kowalski & Crocker, 2001).

Procedure

Similar procedures were followed as in Study 1. However, changes were introduced in the induction of stress. Stress was induced using a combination of evaluation apprehension, prize money, the introduction of a 'funny putter,' and ego-threatening feedback. The following statement was provided at the beginning of the stress condition:

> In the next set of 20 putts we would like you to use a newly designed putter which is said to improve golf-putting performance. In addition to this we are going to film this part of the session. We are keen to discover how people adapt to using this new putter. In addition, we will have a prize for the person who holes the most putts. You can win £25 pounds if you are the person who holes the most putts.

After 10 attempts additional information was provided to the participants that included ego-threatening feedback (Baumeister, 1984).

> So far, your performance is worse than expected you have holed (number of putts they had missed so far) putts less than the best performer.

Analysis Strategy

A similar analysis strategy was adopted as previously described for Study 1. In addition, we conducted independent t-test's to establish whether the males and females differed in self-reported stress intensity and control.

Results

Stress Intervention

Table 1 presents the means and standard deviations of the dependent variables for the males and females in both the control and stress condition. Adequate reliability was obtained for somatic (Cronbach α = .82 and .73) and cognitive anxiety (Cronbach α = .86 and .76) scales of the CSAI-R2 for the two measurements.

The repeated measures MANOVA had a significant time main effect (Wilks' lambda = .86, p = .04, η^2 = .14) but no gender main effect or interaction effects (p > .05). Table 2 provides the

results of the repeated measures ANOVA. Significant condition main effects were obtained for heart-rate F (*1,29)* = 8.65, p = .01, η^2 = 0.23, task completion time F(*1,29)* = 28.13, $p < .001$, η^2 = 0 .50, and performance F (*1,29)* = 9.01, $p = .01$, η^2 = 0.23). Significantly higher average heart-rate and increased completion time were found in the stress condition compared to the control condition. In addition, participants performed significantly better in the control condition compared with the stress condition.

No gender differences were observed in terms of stress response. Also, the male and female participants did not report different levels of stress intensity $t(29) = 0.07$, $p = .95$ or perceived control $t(29) = 0.43$, $p = .67$ after completion of the golf putting task.

Gender and stressor type

Table 4 provides an overview of the frequency of reported stressors by the male and female participants in the stress condition. Overall, there was no gender difference in the number of stressors reported ($\chi^2 = 1.00$, $p = .32$). Females, however, reported significantly more frequently task execution ($\chi^2 = 4.84$, $p = .03$) as a stressor than the males. Males again reported more outcome as a stressor ($\chi^2 = 3.81$, $p = .05$).

Gender, stressor type, and coping

Table 4 provides an overview of the coping responses by the male and female participants in the stress condition in relation to the stressors reported. Differences in coping between the genders were particularly apparent for the stressors task execution and outcome. The females used more technique and positive self-talk coping strategies for both stressors, whereas the males used more external attribution and goal-setting for the outcome stressor. However, females also used more positive self-talk for the physical discomfort and speak aloud stressors, whereas the males used acceptance for the physical discomfort stressor.

Discussion

In Study 2 we were successful in inducing increased levels of stress in the participants, as a significant increase in heart-rate, task completion time, and decrements in performance were found

in the stress compared to the control condition. Similar to Study 1, there were differences in the frequency of reported stressors between the genders. These differences partly explained why males and females used different coping strategies. This study also obtained some differences in coping behavior which were unrelated to differences in appraisal. As such differences in coping preferences between the genders in Study 2 were only in part the result of males and females appraising the stress situation differently in terms of frequency of reported stressors. Consequently, this provides only partial support for the situational hypothesis.

No significant change was observed for the somatic or cognitive anxiety scale of the CSAI-2R (Cox et al., 2003). This finding might be due to the stress manipulation. The ego-threatening feedback was only provided after ten attempts and as such did not influence pre-performance anxiety levels. Females reported task execution as a stressor significantly more often than males who in turn reported outcome more often than the females. These findings could be related to differences in the motivational orientation among males and females within achievement situations. Females are more likely to be task-orientated whereas males are more likely to be ego-orientated (e.g., White & Duda, 1994).

Females reported more technique coping and self-talk to cope with stressors such as task execution and outcome. Males, on the other hand, reported more external attribution for the stressor outcome. The use of positive self-talk and technique coping among the females, and the use of external attribution in the males would support Zuckerman's (1979) observation. Women are more inclined to attribute success to effort whereas men are more likely to attribute success to ability. External attribution is a convenient coping strategy for outcome oriented participants who do not achieve their expected goals. Study 2 also found some differences in coping for the stressors physical discomfort and speak aloud. The females used more positive self-talk for both stressors whereas the males used more acceptance and external attribution for the physical discomfort and speak aloud stressors respectively.

The findings of Study 2 were not exactly the same as Study 1. This suggests that different stress manipulations influence the appraisal process and coping behavior of males and females. Overall, the cognitive appraisal process, which is influenced by biological and social factors (Taylor, Klein, Lewis, Guenewald, Gurung, & Updgraff, 2000), could explain the gender differences in stressors reported. The different coping strategies reported in Study 2 are more likely the consequence of these stressor appraisal differences.

General Discussion

We successfully induced stress in both Study 1 and Study 2. Significant and consistent gender differences were observed in the different frequency of reported stressors. Across both studies females reported being concerned with task execution and males with the outcome. Also, the females reported the putter more frequently as a stressor in Study 1. Despite creating a similar stress event for the participants, different stimuli were appraised more or less frequently as being stressful by the male and female participants. These stressor appraisal differences between the genders could be the result of different motivational orientation in achievement situations. The notion that males are generally more ego-orientated and females more task-orientated (e.g., White & Duda, 1994) might explain why males and females reported different stressors more or less frequently. It is unclear whether such differences in motivational orientation are the result of social or biological processes. That is, whether motivational orientation is a consequence of learning or genetics.

Gender differences in the stressors experienced have been reported previously in the literature (Folkman & Lazarus, 1980). The results of the present studies suggest that even in a controlled situation, gender differences transpire in the cognitive significance attributed to the stressors encountered. The adopted methodology was crucial in obtaining this information, contributing in this way to the full exploration of gender differences in coping. Thinking aloud whilst executing a motor task allows the exploration of the stimuli that participants appraise as being stressful in a controlled encounter during real time as opposed to a retrospective recall of a single stressful event (e.g., Hoar et al., 2010). The results of the present study provide some support

for the notion that differences in stress appraisals cause male and female participants to deploy different coping strategies (Lee-Baggley et al., 2005). Similar to Hoar et al.'s (2010) findings, gender differences in coping observed in our two studies are likely to be caused by males and females reporting different stressors, as opposed to differences in intensity of the one's feelings associated with different stressors.

There is currently no gold standard method of measuring coping. Ecological approaches result in concrete descriptions, but this may miss reports of more complex, abstract problems, and broader conceptualization of coping that are better perceived with some retrospection (Folkman & Moskowitz, 2004). Think aloud protocols offer a promising avenue for stress and coping researchers (for a review see Nicholls & Ntoumanis, 2010). The fullest understanding of coping will be achieved using a combination of methodologies and research designs.

In conclusion, the findings from Study 1 and Study 2 indicate that although there were no gender stress intensity differences, there were gender differences in terms of the frequencies of certain stressors reported. When in the same stressful situation, males and females tend to differ in what stimuli they appraise as being stressful and how often they appraise stressors. Gender differences in stress appraisals observed in the studies might be the result of social roles males and females play in society or achievement situations. These roles might shape appraisal in future stress encounters. Alternatively, these differences might be due to dispositional factors. Future research could consider stress appraisal in relation to gender and coping. The results of both our studies suggest that variations in stressor appraisal can explain some of the differences observed in coping between males and females. Our findings therefore provide tentative support for the situational hypothesis. Finally, in line with previous research recommendations (Kaiseler et al., 2012) our findings add support to the idea that applied practitioners should contemplate the cognitive appraisal process before teaching different coping skills for male and female athletes.

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Table 1

Mean and Standard Deviations for the Dependent Variables for Males and Females Separately, and for the sample as a whole in the Control and Experimental Conditions for Study 1 and Study 2.

	Males control		Females control		Overall control		Male Stress		Female Stress		Overall Stress	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Study 1												
Heart-rate (BPM)	95.65	10.02	92.08	9.95	93.91	10.01	98.77	9.91	95.24	9.91	97.06	9.94
Task completion time	4.76	1.55	4.45	1.40	4.61	1.47	5.39	1.64	4.98	1.45	5.19	1.54
Somatic anxiety	16.16	5.31	14.60	4.53	15.40	4.93	16.47	3.91	17.06	5.29	16.75	4.57
Cognitive anxiety	19.26	6.01	17.22	5.27	18.27	5.67	20.94	5.31	21.44	6.46	21.18	5.82
Performance	9.89	5.65	6.44	3.31	8.21	4.92	9.26	4.45	6.72	3.59	8.02	4.20
Study 2												
Heart-rate (BPM)	91.29	15.68	86.43	9.24	89.06	13.19	93.41	16.98	88.21	8.28	91.06	13.80
Task completion time	4.05	1.35	3.61	0.67	3.85	1.10	4.77	1.48	4.34	0.98	4.57	1.27
Somatic anxiety	14.11	4.19	13.67	3.20	13.91	3.72	13.94	4.41	15.92	4.55	14.84	4.51
Cognitive anxiety	13.88	4.32	16.71	5.24	15.16	4.89	14.94	6.09	17.57	6.08	16.12	6.13
Performance	11.18	3.89	8.86	5.08	10.13	4.54	9.19	4.28	8.00	5.05	8.65	4.60
Stress Intensity							4.17	2.51	4.11	2.30	4.15	2.37
Control							5.96	2.58	5.58	2.31	5.79	2.43

Table 2

Results of the Repeated Measures Analysis of Variance (gender (2) by condition (no-stress vs. stress) Including Effect Size for Study 1 (F(1,31)) and Study 2 (F(1,29)).

	Gender main effect	Condition main effect	Gender by time interaction
Study 1			
Heart-rate (bpm)	1.13, p = .26, η^2 = .04	9.41, p = .004, η^2 = .21**	0.00, p = .98, η^2 = .00
Task completion time	0.55, p = .55, η^2 = .02	22.58, p < .001, η^2 = .39**	0.16, p = .69, η^2 = .01
Somatic anxiety	0.14, p = .71, η^2 = .01	2.32; p= .14, η^2 = .06	1.42, p = .24, η^2 = .04
Cognitive anxiety	0.22, p = .64, η^2 = .01	9.33, p = .004, η^2 = .21**	1.72, p = .20, η^2 = .05
Performance	5.11, p = .03, η^2 = .13*	0.10, p = .75, η^2 = .00	0.66, p = .42, η^2 = .02
Study 2			
Heart rate (bpm)	1.09, p = .31, η^2 = .04	8.65, p = .01, η^2 = .23*	0.06, p = .80, η^2 = .00
Task completion time	1.12, p = .30, η^2 = .04	28.13, p < .001, η^2 = .50**	0.00, p = .99, η^2 = .00
Somatic anxiety	0.32, p = .58, η^2 = .01	2.75; p= .11, η^2 = .09	3.71, p = .06, η^2 = .11
Cognitive anxiety	2.22, p = .15, η^2 = .07	1.77, p = .19, η^2 = .05	0.02, p = .89, η^2 = .00
Performance	1.23, p = .28, η^2 = .04	9.01, p = .01, η^2 = .23*	1.44, p = .24, η^2 = .05

*p < .05; ** p < .01

Table 3

The Stressors Reported by Females and Males in the Experimental Stress Condition from Study 1 and the Coping Strategies Utilized to Manage each Stressor.

Stressors	Coping	Males Stress (n = 16)	Females Stress (n = 15)
Evaluation apprehension		**3 (2) 1-2; 0.18**	**5(5) 1-1; 0.33**
	Take time	-	1 (1) 1-1; 0.06
	Positive self-talk	2 (1) 2-2; 0.12	1 (1) 1-1; 0.06
	Relaxation	-	1 (1) 1-1; 0.06
Financial inducement		**21 (8) 1-4; 1.31**	**22 (9) 1-4; 1.46**
	Concentration	2 (2) 1-1; 0.12	2 (2) 1-1; 0.12
	Planning	3 (2) 1-2; 0.19	1 (1) 1-1; 0.06
	Take time	1 (1) 1-1; 0.06	1 (1) 1-1; 0.06
	Technique	4 (2) 2-2; 0.25	3 (2) 1-2; 0.20
	Acceptance	1 (1) 1-1; 0.06	2 (2) 1-1; 0.12
	Positive self-talk	10 (5) 1-3; 0.63	7 (4) 1-3; 0.47
	Relaxation	1 (1) 1-1; 0.06	-
	Blocking	1 (1) 1-1; 0.06	-
	External attribution	1 (1) 1-1; 0.06	1 (1) 1-1; 0.06
Putter*		**13 (7) 1-4; 0.81**	**32(12) 1-5; 2.1**
	Concentration	3 (2) 1-2; 0.18	-
	Goal setting	1 (1) 1-1; 0.06	2 (2) 1-1; 0.12
	Take time	-	1 (1) 1-1; 0.06
	Acceptance	-	5 (3) 1-2; 0.33
	Positive self-talk	5 (3) 1-2; 0.31	8 (4) 1-3; 0.53
	Relaxation	1 (1) 1-1; 0.06	-
	Blocking	2 (2) 1-1; 0.12	-
	External attribution	-	3 (2) 1-2; 0.20
Task execution*		**15(9) 1-4; 0.93**	**29 (11) 1-6; 1.93**
	Concentration	1 (1) 1-1; 0.06	3 (2) 1-2; 0.20
	Goal setting	4 (3) 1-2; 0.25	4 (3) 1-2; 0.26
	Take time	5 (3) 1-3; 0.31	1 (1) 1-1; 0.06
	Technique	22 (6) 1-8; 1.37	15 (5) 1-4; 1.0
	Acceptance	5 (3) 1-3; 0.31	4 (3) 1-3; 0.26
	Imagery	4 (3) 1-3; 0.25	1 (1) 1-1; 0.06
	Positive self-talk	32 (8) 1-8; 2.0	21 (6) 1-6; 1.4

	Relaxation	6 (2) 2-4; 0.25	2 (2) 1-1; 0.12
	Blocking	4 (2) 1-2; 0.25	4 (2) 2-2; 0.26
	Lack of coping	1 (1) 1-1; 0.06	3 (3) 1-1; 0.20
	External attribution	4 (2) 1-3; 0.25	6 (4) 1-2; 0.40
Outcome*		**37(12) 1-5; 2.31**	**23(10) 1-4; 1.53**
	Goal setting	12 (3) 3-6; 0.75	4 (3) 1-2; 0.26
	Planning	6 (3) 1-3; 0.37	-
	Take time	-	1 (1) 1-1; 0.06
	Acceptance	4 (3) 1-2; 0.25	-
	Positive self-talk	10 (5) 1-3; 0.63	2 (2) 1-1; 0.12
	Relaxation	2 (2) 1-1; 0.25	-
	External attribution	1 (1) 1-1; 0.06	-
Physical discomfort		**8(5) 1-2; 0.50**	**3(2) 1-2; 0.20**
	Goal setting	-	3 (2) 1-2; 0.20
	Take time	-	1 (1) 1-1; 0.06
	Positive self-talk	1 (1) 1-1; 0.06	2 (2) 1-1; 0.12
	Wishful thinking	2 (2) 1-1; 0.25	
	Blocking	1 (1) 1-1; 0.06	-
Speak aloud		**1(1) 1-1; 0.06**	**7(3) 1-3; 0.46**
	Concentration	-	4 (2) 1-2; 0.26
	Positive self-talk	1 (1) 1-1; 0.06	1 (1) 1-1; 0.06
	Lack of coping	-	3 (2) 1-2; 0.20
Goal endangerment		**-**	**1(1) 1-1; 0.06**
Lack of concentration		**2(1) 2-2; 0.12**	**2(2) 1-1; 0.12**

Note. The first number represents the absolute frequency of the reported stressors or coping strategies. Between brackets how many participants reported this stressor or coping strategy followed by the range. Finally, the relative frequency is reported (absolute number of reported divided by the total number of participants of which data were obtained). *$p < .05$

Table 4

The Stressors Reported by Females and Males in the Experimental Stress Condition in Study 2 and the Coping Strategies used to manage each stressor.

Stressors	Coping	Males experimental (n = 17)	Females experimental (n = 14)
Evaluation apprehension		**5 (4) 1-2; 0.29**	**3 (3) 1-1; 0.21**
Financial inducement		**7 (5) 1-2; 0.41**	**4 (3) 1-2; 0.21**
	Technique	2 (2) 1-1; 0.11	-
	Relaxation	1 (1) 1-1; 0.06	-
	Blocking	2 (2) 1-1; 0.11	1 (1) 1-1; 0.07
Putter		**19 (9) 1-5; 1.11**	**14 (8) 1-3; 1.00**
	Take time	-	2 (2) 1-1; 0.14
	Technique	18 (6) 1-7; 1.05	12 (5) 2-4; 0.86
	Acceptance		1 (1) 1-1; 0.07
	External attribution	1 (1) 1-1; 0.06	1 (1) 1-1; 0.07
Goal endangerment		**2 (2) 1-1; 0.11**	**2(1) 1-1; 0.12**
	Technique	2 (2) 1-1; 0.11	-
	Positive self-talk	1 (1) 1-1; 0.06	-
Lack of concentration		**2 (2) 1-1; 0.11**	**3 (3) 1-1; 0.21**
	Concentration	2 (2) 1-1; 0.11	1 (1) 1-1; 0.07
	Technique	-	4 (3) 1-2; 0.29
	Positive self-talk	2 (2) 1-1; 0.11	-
Task execution*		**28 (10) 1-5; 1.64**	**36 (13) 1-5; 2.57**
	Concentration	8 (4) 1-4; 0.47	6 (5) 1-2; 0.42
	Goal setting	4 (4) 1-1; 0.24	4 (3) 1-2; 0.29
	Planning	1 (1) 1-1; 0.06	4 (2) 1-3; 0.29
	Technique	14 (5) 1-5; 0.82	20 (5) 2-8; 1.43
	Acceptance		2 (2) 1-1; 0.14
	Positive self-talk	20 (6) 1-5; 1.18	22 (6) 1-8; 1.50
Outcome*		**37 (13) 3-5; 2.17**	**22 (10) 1-5; 1.57**
	Concentration	1 (1) 1-1; 0.06	-
	Goal setting	5 (3) 1-3; 0.29	1 (1) 1-1; 0.07
	Take time	3 (2) 1-2; 0.17	4 (3) 1-2; 0.29
	Technique	8 (4) 1-3; 0.47	10 (4) 2-3; 0.71
	Positive self-talk	3 (3) 1-1; 0.17	9 (4) 1-3; 0.64
	External attribution	4 (2) 2-2; 0.24	-

Physical discomfort		**3 (3) 1-1; 0.18**	**3 (3) 1-1; 021**
	Goal setting	3 (2) 1-2; 0.18	-
	Technique	-	2 (2) 1-1; 0.14
	Acceptance	7 (3) 1-4; 0.41	2 (2) 1-1; 0.14
	Positive self-talk	-	5 (3) 1-3; 0.36
	Wishful thinking	1 (1) 1-1; 0.06	1 (1) 1-1; 0.07
Speak aloud		**8 (4) 1-4; 0.47**	**3 (3) 1-1; 0.21**
	Acceptance	1 (1) 1-1; 0.06	1 (1) 1-1; 0.07
	Positive self-talk	-	5 (3) 1-3; 0.36
	External attribution	3 (2) 1-2; 0.18	-

Note. The first number represents the absolute frequency of the reported stressors or coping strategies. Between brackets how many participants reported this stressor or coping strategy followed by the range. Finally, the relative frequency is reported (absolute number of reported divided by the total number of participants of which data were obtained). *$p < .05$